

International Lake Superior

Board of Control

Semi-Annual Progress Report to the International Joint Commission

Covering the Period March 19, 1999 to September 15, 1999



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International Lake Superior Board of Control

September 15, 1999

International Joint Commission
Washington, D.C.
Ottawa, Ontario

Commissioners:

This semi-annual report covers the Board's activities from March 19 to September 15, 1999.

1. Highlights

The Lake Superior level remained below its seasonal average over the past six months. Higher than average water supplies to Lake Superior in July caused its level to rise closer to average by the end of the period. In mid September, the level was 9 cm (3.5 inches) below the average for that time of year and 16 cm (6.3 in) higher than that one year ago.

Below average water supplies to Lakes Michigan-Huron kept these lakes below average during the past six months. At the end of the reporting period, their levels were 32 cm (13 in) below average, and 44 cm (17 in) below those of one year ago.

The Lake Superior outflows were essentially as specified by Regulation Plan 1977-A. A flow slightly below plan in April was due to an unanticipated equipment failure at the facilities of Great Lakes Power Limited.

In August, the regulation plan called for the gate setting at the Compensating Works for the main rapids area to be increased from one-half gate to two gates open.

On July 6, the Board held a public meeting in Sault Ste. Marie, Ontario. Earlier that day, Board members and associates accompanied the United States Chairman of the Commission and Commission staff on a tour of the project area including a visit to the Compensating Works and the recently refurbished Canadian navigation lock.

As expected, there were few complaints this year about shoreline erosion from Lake Superior or Lakes Michigan-Huron shore property owners. This is in contrast to the numerous high water level complaints heard over the past two years and at the Board's public meeting in June 1998 in South Haven, Michigan.

2. Monitoring of Hydrologic Conditions

The Board, through its Regulation Representatives and On-Site Representatives, continuously monitors the water levels of Lakes Superior and Michigan-Huron, and the water levels and flows in the St. Marys River. The Regulation Representatives' monthly reports to the Board provide a hydrologic assessment, as well as recommendations on the regulation of outflows from Lake Superior. These reports also indicate the amount of water available for hydropower purposes, after the requirements for domestic use, navigation, and the fishery (St. Marys Rapids) are met.

Tables 1 and 2 list the recent monthly water levels, net basin supplies, and outflows for Lakes Superior and Michigan-Huron, respectively. Figure 1 compares the monthly water levels for this period to long-term averages and extremes. Figure 2 shows the monthly precipitation over the Lake Superior and Lakes Michigan-Huron basins.

On the Lake Superior basin, precipitation was below average in March and April while May, July and August had above average precipitation. June was near average. The total amount for these six months was 112% of average. On the Lakes Michigan-Huron basin, precipitation was very low in March and August, near average in May, and above average the other months. Total precipitation on the Lakes Michigan-Huron basin for these six months was about 105% of average. However, high evaporation and low runoff resulted in below average supplies (as shown in Table 2).

As indicated in Figure 1, the water level of Lake Superior in March this year was 20 cm (7.9 in) below the long-term average for that time of the year. The level rose a little more than usual in subsequent months but remained below average throughout the reporting period. The lake level peaked for the year on August 18 at a daily mean level of 183.50 m (602.03 ft). On September 15, Lake Superior was at elevation 183.48 m (601.97 ft), about 9 cm (3.5 in) below average and 16 cm (6.3 in) higher than one year ago.

The levels of Lakes Michigan-Huron were also below average during the reporting period. The seasonal rise in the level of these lakes this year was less than usual, due to dry conditions on the basin. This put the lakes 32 cm (13 in) below average by mid September, compared to 12 cm (4.7 in) below average six months earlier. The lakes peaked for the year on July 28, at a daily mean level of 176.42 m (578.81 ft).

3. Regulation of the Outflow from Lake Superior

During the reporting period, the outflows of Lake Superior were as specified by Regulation Plan 1977-A with some minor deviations. In early April, due to an unanticipated equipment failure at the facilities of Great Lakes Power Limited, the hydropower utility could not use its full share of allotted water. On the recommendation of the Board and with the approval of the Commission, the Lake Superior outflow for the month of April was reduced by about 2.6%, or from 1560 m³/s to 1520 m³/s (55,100 cfs to 53,700 cfs). The effect of this flow deviation was equivalent to about 0.1 cm (0.04 in) temporary raising impact on Lake Superior. Other minor under-discharge deviations occurred in June, July and August when the hydropower utilities in both countries could not use their full share of the water for hydropower purposes. This is not an unusual situation.

The gate open setting at the Compensating Works was maintained at an equivalent one-half gate open from March through July. This one-half gate open setting had been in place since the summer of 1997. For the month of August, the regulation plan called for a setting of two gates fully open. During the first two weeks of August, the gates were varied between one-half gate open to five gates open to allow flow measurements to calibrate the Compensating Works. For the remainder of August, three gates were fully open to partially offset the shortfall in the water use by the hydropower plants.

In September, a two gate open setting was maintained. On September 9 and 10, the Board directed short-term changes in the gate open pattern to accommodate a request by the International Bridge Authority to conduct an under-water inspection of the piers of the International Bridge. The bridge is located a short distance downstream of the Compensating Works.

Throughout the reporting period, Gate 1, which supplies water to the Fishery Remedial Works, remained set at 15 m³/s (530 cfs).

4. Governing Conditions During the Reporting Period

The monthly mean levels of Lake Superior during the reporting period were within the limits of 182.76 and 183.86 m (599.6 and 603.2 feet) specified in the Commission's Orders of Approval.

During the reporting period, the daily mean water levels in the lower St. Marys River at the U.S. Slip Gauge downstream of the U.S. Locks, varied between elevations 176.33 m and 176.90 m (578.51 and 580.38 feet). The requirement for maintaining the river level at that location below 177.94 m (583.8 feet) was satisfied.

5. Maintenance and Repairs at the Compensating Works

No repairs were required on the Compensating Works this year. An underwater video inspection of the U.S. side of the Compensating Works was completed on June 30 of this year. An assessment of the results is underway. An underwater inspection of the Canadian portion of the structure was conducted in 1995 as part of the 5-year inspection program.

A 5-year major inspection of the structure is scheduled for the year 2000.

On July 6, Board members and associates accompanied the United States Chairman of the Commission and Commission staff on a tour of the project area including a visit to the Compensating Works and the recently refurbished Canadian navigation lock.

6. Repairs and Maintenance at the Hydropower Facilities

An unexpected failure of a unit transformer at the Great Lakes Power Limited plant in mid April resulted in a shut down of one of the hydro-electric generating turbines at the Clergue plant in Sault Ste. Marie, Ontario. This unexpected outage caused a reduction in the flow discharged through the hydropower plant in April. The transformer was repaired and put back in service in May. While this transformer was out of service, the opportunity was taken to complete a major overhaul of one of the three turbine-generator units at the plant.

Other than normal maintenance, no major repair work was carried out at either the U.S. Government or Edison Sault Electric Company hydropower plants.

7. Water Usage in the St. Marys River

Table 3 (Table 4 in U.S. Customary units) lists the distribution of outflows from Lake Superior for January-August 1999. Water uses are divided into four categories: domestic, navigation, fishery, and hydropower. According to the 1979 Supplementary Order, after the first three water requirements are satisfied, the remaining outflow from Lake Superior is shared equally between the U.S. and Canada for hydropower purposes. Any remaining flow allotment, beyond the discharge capacity of the hydropower plants, will normally be discharged through the Compensating Works and the St. Marys Rapids.

As shown in the tables, the amount of water used for domestic purposes was fairly constant and averaged about 4 m³/s (140 cfs). The amount required for navigation lockage depended on traffic volume and varied from 1 to 20 m³/s (40 to 710 cfs).

In accordance with the orders of the Commission, to fulfill the fishery needs in the main Rapids, a minimum Compensating Works gate setting of 1/2 gate open, or its equivalent, is required at all times. In addition, a flow of at least 15 m³/s (530 cfs) in the fishery remedial works (through Gate 1) must be maintained. As discussed earlier, the gate open setting for the main portion of the Rapids as well as for the fishery remedial works met requirements during the reporting period.

As previously reported, the Canadian navigation lock was returned to service in July 1998 following two years of extensive modifications. The refurbished lock is now smaller in size and serves pleasure craft and tour boats. The Canadian Department of Heritage, which owns the lock, is currently examining the feasibility of installing and operating eight low-head hydropower units at the site. The units would operate when the lock is closed to vessels and during the non-navigation season. While there has been some informal exchange of information between Board representatives and Canadian Heritage, no formal proposal or request has been received by the Board.

A series of ADCP flow measurements were made in the power canals in June of this year to check the accuracy of the flow measurement methods used by the three hydropower power entities. A similar set of measurements were made in August of 1998. In both sets, there were some discrepancies between reported and measured flows. The Board is exploring the reasons for these discrepancies with the plant operators.

8. Long Lac and Ogoki Diversions

Ontario Power Generation continued to provide the Board with information on the operations of the Long Lac and Ogoki Diversions. The Ogoki Diversion into Lake Nipigon (which flows into Lake Superior) averaged 121 m³/s (4,290 cfs) from March through August 1999. The Long Lac Diversion averaged 41 m³/s (1,450 cfs) for the same period. Combined, these diversions were about 98 percent of average for the period.

At the Long Lac diversion project, beginning in May this year a continuous flow of at least 2 m³/s (70 cfs) is to be maintained in the summer period (through about Labour Day) from the north outlet of Long Lake. This agreement between Ontario Power Generation and the local First Nations provides “environmental enhancement” water to the Kenogami River.

9. Annual Meeting with the Public and Public Information

The Board held its annual meeting with the public on July 6 in Sault Ste. Marie, Ontario. About 10 people attended. In addition to the water level issues, questions and views expressed by those attending included climate change, the environment, and land use. One issue noticeably absent during the public meeting was concern about flood and erosion damage on the upper Great Lakes.

The Board continues to issue, at the beginning of each month, news releases informing the public about Lake Superior regulation and water level conditions. An announcement of the gate operations at the Compensating Works was included in the August issue to caution visitors and anglers about water level and flow changes in the St. Marys Rapids during the flow measurements at the Compensating Works. An added news release was issued in April to inform the public of the April flow reduction at the Great Lakes Power Limited plant.

In support of the Board and the Commission, the Detroit District of the Corps of Engineers

maintains a Board home page on the World Wide Web. It includes information on the Board and its activities, news releases and updates on Great Lakes basin conditions.

10. Review of the Orders of Approval and Regulation Plan

In February 1995, the Commission requested the Board to prepare a scope of work outlining the investigations which should be carried out to review the Orders of Approval and Regulation Plan 1977-A. The purpose of a review is to determine if the Orders and the regulation plan are consistent with the current needs of the users and interests in the upper Great Lakes system. The Board submitted the scope of work to the Commission on March 29, 1996. By letter of June 17 of that year, the Commission agreed with the Board's recommendation to defer consideration of this work pending completion of the Lake Ontario regulation criteria review. Discussions between the Board and the Commission staff on this matter continue.

In 1998, the International Great Lakes Coalition developed a regulation plan and presented it to the three Great Lakes Boards of Control for consideration. This proposed regulation plan includes new regulatory works at the head of the Niagara River and new methods in the regulation of the outflows of Lake Superior and Lake Ontario. On March 18, 1999, during the Lake Superior Board's annual spring meeting in New York City, members of the International Great Lakes Coalition made a presentation to the three Great Lakes Boards on its proposed regulation plan. By letter dated May 14, 1999, the three Boards replied to the Coalition stating that the Boards do not at the present time support regulatory actions that would purposefully cause significant system-wide lowering of the lake level regimes.

11. Board Membership and Meetings

BG Robert H. Griffin became United States Board member on August 9, 1999. He replaced BG Hans Van Winkle who took on a new assignment with the U.S. Army Corps of Engineers.

The Board met in Niagara Falls, Ontario on September 15.

Respectfully submitted,

BG Robert H. Griffin
Member for United States

Doug Cuthbert
Member for Canada

Figure 1

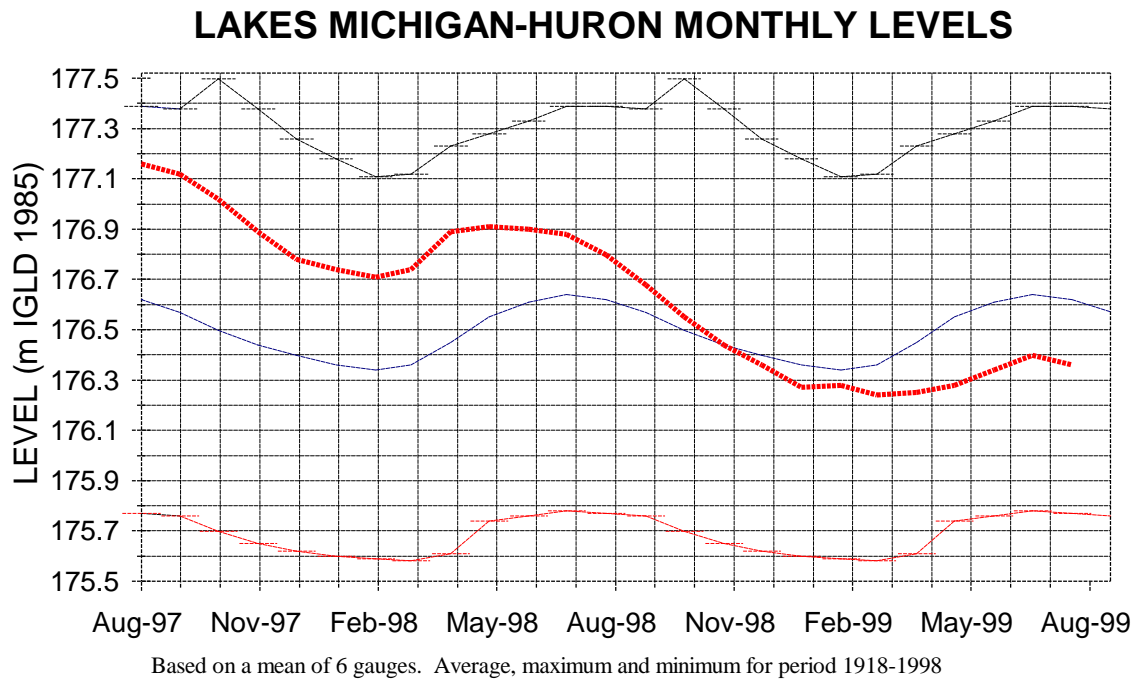
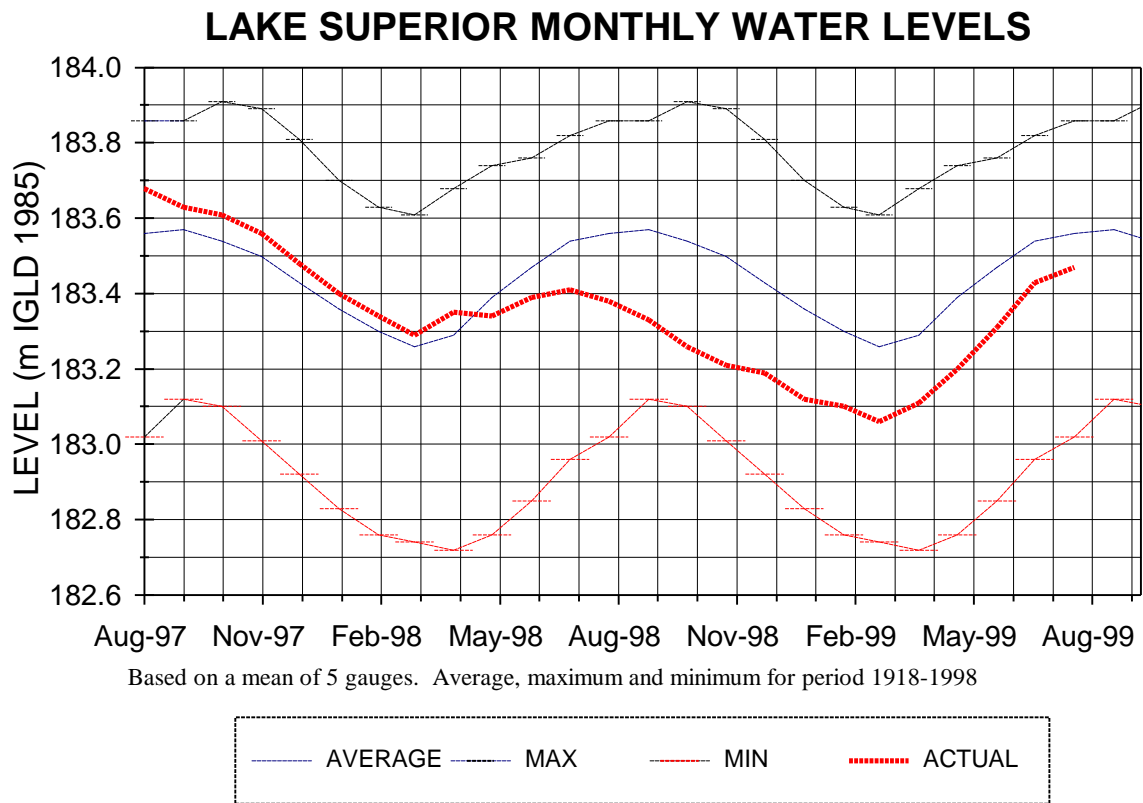


Figure 2

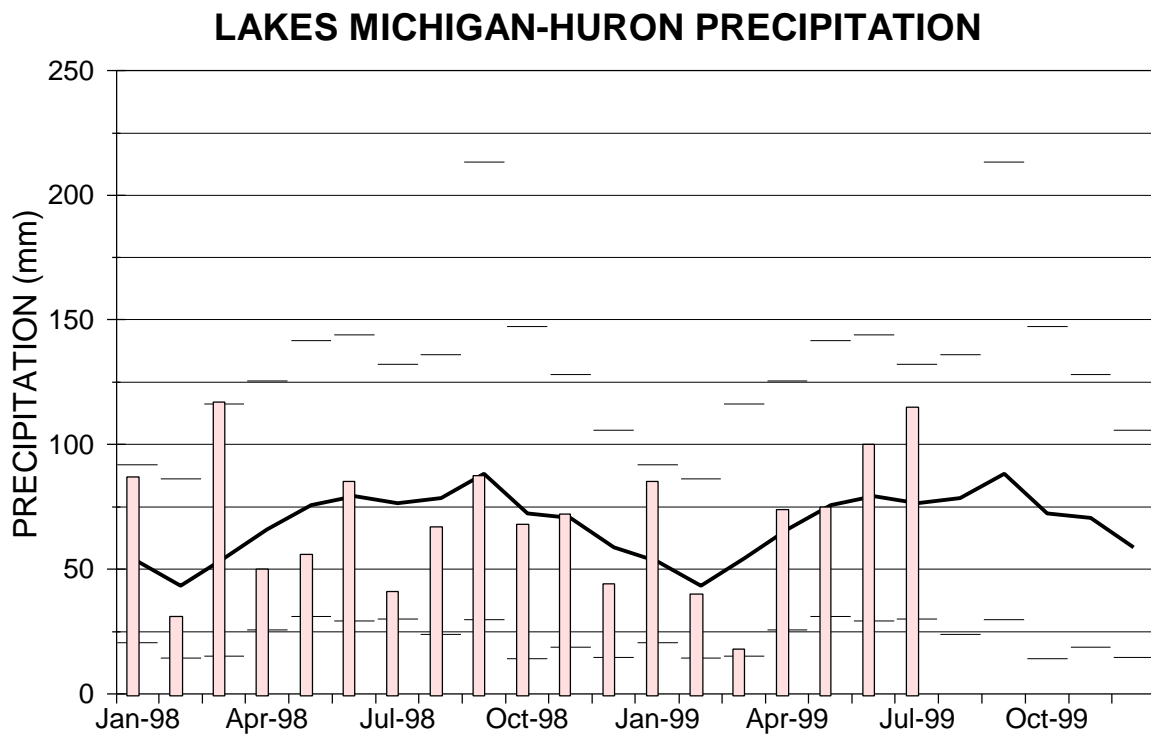
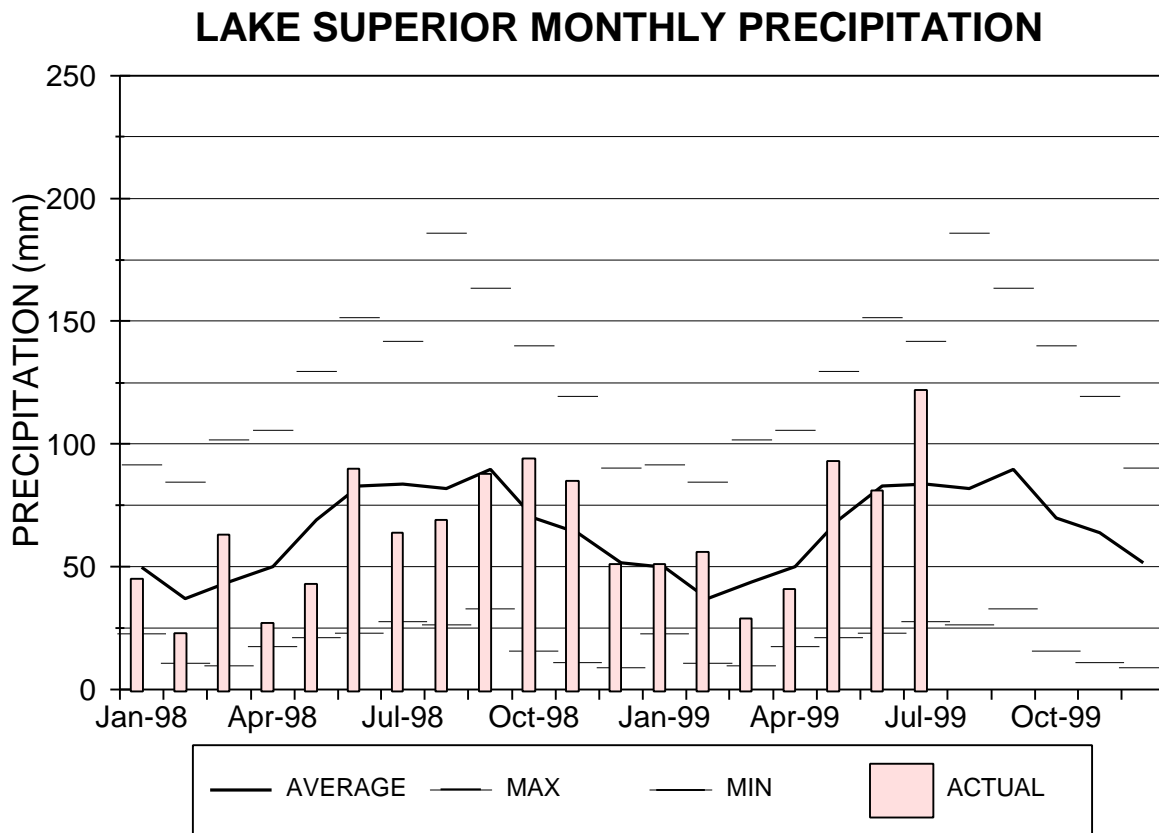


TABLE 1. 1998-1999 Lake Superior Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded ¹		Difference From Average ²		Monthly Mean Recorded		Exceedence Probability	Monthly Mean Recorded		Percent of Average ³
	metres	feet	metres	feet	m3/s	tcfs	(%)	m3/s	tcfs	
Apr-98	183.35	601.54	0.06	0.20	2210	78	94	1940	69	99
May-98	183.34	601.51	-0.05	-0.16	2600	92	95	2030	72	96
Jun-98	183.39	601.67	-0.08	-0.26	3970	140	60	1800	64	82
Jul-98	183.41	601.74	-0.13	-0.43	820	29	>99 *	1800	64	79
Aug-98	183.38	601.64	-0.18	-0.59	290	10	>99 *	1590	56	67
Sep-98	183.33	601.48	-0.24	-0.79	-370	-13	96	1550	55	65
Oct-98	183.26	601.25	-0.28	-0.92	-400	-14	87	1560	55	68
Nov-98	183.21	601.08	-0.29	-0.95	770	27	39	1560	55	69
Dec-98	183.19	601.02	-0.24	-0.79	-480	-17	42	1560	55	75
Jan-99	183.12	600.79	-0.24	-0.79	-460	-16	54	1560	55	80
Feb-99	183.10	600.72	-0.20	-0.66	1150	41	13	1560	55	82
Mar-99	183.06	600.59	-0.20	-0.66	220	8	80	1570	55	84
Apr-99	183.11	600.75	-0.18	-0.59	4250	150	46	1520	54	78
May-99	183.20	601.05	-0.19	-0.62	5760	203	38	1550	55	73
Jun-99	183.31	601.41	-0.16	-0.52	3700	131	67	2070	73	94
Jul-99	183.43	601.80	-0.11	-0.36	6060	214	3	2180	77	95
Aug-99	183.47	601.94	-0.09	-0.30	1660	59	84	2480	88	104

Notes: m3/s = cubic metres per second tcfs = 1000 cubic feet per second

1 Water Levels are a mean of five gauges on Lake Superior, IGLD 1985

2 Average levels are for period 1918-1998, based on a mean of five gauges. Differences computed as metres and then converted to feet.

3 Average flows are for the period 1900-1989.

* The monthly supplies of July and August 1998 set new record lows for those months

TABLE 2. 1998-1999 Lakes Michigan-Huron Hydrologic Factors

Month	Levels				Net Basin Supplies			Outflows		
	Monthly Mean Recorded ¹		Difference From Average ²		Monthly Mean Recorded		Exceedence Probability	Monthly Mean Recorded		Percent of Average ³
	metres	feet	metres	feet	m3/s	tcfs	(%)	m3/s	tcfs	
Apr-98	176.89	580.35	0.44	1.44	7380	261	59	5660	200	110
May-98	176.91	580.41	0.36	1.18	4610	163	87	5660	200	106
Jun-98	176.90	580.38	0.29	0.95	3970	140	85	5680	201	104
Jul-98	176.88	580.31	0.24	0.79	-480	-17	>99	5700	201	103
Aug-98	176.80	580.05	0.18	0.59	930	33	63	5560	196	101
Sep-98	176.68	579.66	0.11	0.36	-1670	-59	90	5600	198	102
Oct-98	176.55	579.23	0.05	0.16	-2280	-81	90	5440	192	100
Nov-98	176.44	578.87	0.00	0.00	240	8	64	5280	186	98
Dec-98	176.36	578.61	-0.04	-0.13	-1590	-56	90	5240	185	101
Jan-99	176.27	578.31	-0.09	-0.30	2820	100	17	4290	151	96
Feb-99	176.28	578.35	-0.06	-0.20	2620	93	44	4980	176	114
Mar-99	176.24	578.22	-0.12	-0.39	1430	50	96	4700	166	98
Apr-99	176.25	578.25	-0.20	-0.66	5750	203	84	4950	175	96
May-99	176.28	578.35	-0.27	-0.89	5270	186	79	4940	174	92
Jun-99	176.34	578.54	-0.27	-0.89	5280	186	59	5030	178	92
Jul-99	176.40	578.74	-0.24	-0.79	4850	171	20	5150	182	93
Aug-99	176.36	578.61	-0.26	-0.85	-1650	-58	98	5210	184	94

Notes: m3/s = cubic metres per second tcfs = 1000 cubic feet per second

1 Water Levels are a mean of six gauges on Lakes Michigan-Huron, IGLD 1985

2 Average levels are for period 1918-1998, based on a mean of six gauges. Differences computed as metres and then converted to feet.

3 Average flows are for the period 1900-1989.

TABLE 3: MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOWS (cubic metres/second)

		POWER CANALS				NAVIGATION CANALS			DOMESTIC USAGE			FISHERY	TOTAL LAKE	
YEAR AND MONTH	US GOVT HYDRO	EDISON SAULT EL. CO	US TOTAL	GREAT LAKES POWER	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S.STE MARIE US+CAN	ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	SUPERIOR OUTFLOW m^3/s
1998														
JAN	366	489	855	853	1708	3.8	0	4	0.3	4.9	0.3	6	102	1820
FEB	368	480	848	844	1692	2.1	0	2	0.3	4.9	0.3	6	101	1801
MAR	354	570	924	939	1863	3.5	0	4	0.3	4.7	0.3	5	101	1973
APR	363	550	913	915	1828	10.6	0	11	0.3	4.4	0.3	5	100	1944
MAY	359	595	954	957	1911	12.2	0	12	0.4	4.5	0.3	5	99	2027
JUN	364	465	829	846	1675	14.9	0	15	0.4	4.5	0.3	5	100	1795
JUL	361	463	824	840	1664	15.9	1.2	17	0.4	4.3	0.3	5	110	1796
AUG	358	369	727	735	1462	13.5	2.6	16	0.4	4.3	0.3	5	105	1588
SEP	359	358	717	711	1428	13.4	2.3	16	0.3	4.4	0.3	5	99	1548
OCT	365	359	724	719	1443	11.9	0.4	12	0.3	4.2	0.3	5	98	1558
NOV	366	361	727	722	1449	9.6	0	10	0.3	4.1	0.3	5	97	1561
DEC	365	364	729	724	1453	9.2	0	9	0.3	4.2	0.3	5	97	1564
1999														
JAN	356	376	732	728	1460	2.6	0	3	0.3	4.3	0.3	5	95	1563
FEB	363	370	733	731	1464	1.4	0	1	0.3	4.3	0.3	5	95	1565
MAR	365	371	736	732	1468	2.9	0	3	0.3	4.4	0.3	5	94	1570
APR	368	367	735	674	1409	10.2	0	10	0.3	4.2	0.3	5	95	1519
MAY	362	365	727	705	1432	13	0.5	14	0.4	3.6	0.3	4	96	1546
JUN	366	630	996	953	1949	16.1	1.2	17	0.4	3.6	0.3	4	99	2069
JUL	369	691	1060	994	2054	17.6	2.3	20	0.4	3.6	0.3	4	100	2178
AUG	366	725	1091	989	2080	15.5	2.4	180	0.4	3.6	0.3	4	382	2484

Note: Power Canals columns include flows through power plants and spillways

TABLE 4: MONTHLY DISTRIBUTION OF LAKE SUPERIOR OUTFLOW\$ cubic feet / second)

YEAR AND MONTH	POWER CANALS					NAVIGATION CANALS			DOMESTIC USAGE			FISHERY	TOTAL LAKE	
	US GOVT HYDRO	EDISON SAULT EL. CO	US TOTAL	GREAT LAKES POWER	TOTAL POWER CANALS	UNITED STATES	CANADA	TOTAL NAV. CANALS	S.STE MARIE US+CAN	ALGOMA STEEL	ST MARYS PAPER	TOTAL DOM. USAGE	STE. MARY'S RAPIDS	SUPERIOR OUTFLOW m^3/s
1998														
JAN	12900	17300	30200	30100	60300	134	0	134	11	173	11	195	3600	64200
FEB	13000	17000	30000	29800	59800	74	0	74	11	173	11	195	3570	63600
MAR	12500	20100	32600	33200	65800	124	0	124	11	166	11	188	3570	69700
APR	12800	19400	32200	32300	64500	374	0	374	11	155	11	177	3530	68600
MAY	12700	21000	33700	33800	67500	431	0	431	14	159	11	184	3500	71600
JUN	12900	16400	29300	29900	59200	526	0	526	14	159	11	184	3530	63400
JUL	12700	16400	29100	29700	58800	562	42	604	14	152	11	177	3880	63500
AUG	12600	13000	25600	26000	51600	477	92	569	14	152	11	177	3710	56100
SEP	12700	12600	25300	25100	50400	473	81	554	11	155	11	177	3500	54600
OCT	12900	12700	25600	25400	51000	420	14	434	11	148	11	170	3460	55100
NOV	12900	12700	25600	25500	51100	339	0	339	11	145	11	167	3430	55000
DEC	12900	12900	25800	25600	51400	325	0	325	11	148	11	170	3430	55300
1999														
JAN	12600	13300	25900	25700	51600	92	0	92	11	152	11	174	3350	55200
FEB	12800	13100	25900	25800	51700	49	0	49	11	152	11	174	3350	55300
MAR	12900	13100	26000	25900	51900	102	0	102	11	155	11	177	3320	55500
APR	13000	13000	26000	23800	49800	360	0	360	11	148	11	170	3350	53700
MAY	12800	12900	25700	24900	50600	459	18	477	14	127	11	152	3390	54600
JUN	12900	22200	35100	33700	68800	569	42	611	14	127	11	152	3500	73100
JUL	13000	24400	37400	35100	72500	622	81	703	14	127	11	152	3530	76900
AUG	12900	25600	38500	34900	73400	547	85	632	14	127	11	152	13500	87700

NOTES 1. Power Canals columns include flows through power plants and spillways.

2. Flows for individual users were originally coordinated in m3/s, and are converted here to U.S. customary units (cfs) and rounded to 3 significant figures. Total flow for each category and total Lake Superior flow in this table are computed from the individual flows in cfs.